(f) *Certification short test.* Certification short test emissions from gasoline-fueled Otto-cycle light-duty vehicles shall not exceed the following standards:

(1) Hydrocarbons: 100 ppm as hexane.

(2) Carbon monoxide: 0.5%.

(g) Manufacturers may request to group light-duty vehicles into the same test group as vehicles subject to more stringent standards, so long as those light-duty vehicles meet the most stringent standards applicable to any vehicle within that test group, as provided at § 86.1827(a)(5) and (d)(4).

[64 FR 23925, May 4, 1999, as amended at 65 FR 6854, Feb. 10, 2000; 65 FR 59970, Oct. 6, 2000]

### § 86.1811–04 Emission standards for light-duty vehicles, light-duty trucks and medium-duty passenger vehicles.

(a) *Applicability.* (1) This section contains regulations implementing emission standards for all LDVs, LDTs and MDPVs. This section applies to 2004 and later model year LDVs, LDTs and MDPVs fueled by gasoline, diesel, methanol, ethanol, natural gas and liquefied petroleum gas fuels, except as noted. Additionally, this section contains provisions applicable to hybrid electric vehicles (HEVs) and zero emission vehicles (ZEVs). Multi-fueled vehicles must comply with all requirements established for each consumed fuel.

(2) This section also applies to LDVs, LDTs and MDPVs of model years prior to 2004, when manufacturers certify such vehicles to Tier 2 exhaust emission requirements to utilize alternate phase-in schedules, as allowed under paragraph (k)(6) of this section, and/or to earn early $NO_X$ credits for use in complying with the Tier 2 fleet average $NO_X$ standard which takes effect in the 2004 model year for LDV/LLDTs and 2008 for HLDT/MDPVs.

(3) Except where otherwise specified, this section applies instead of §§ 86.1811–01, 86.1812–01, 86.1813–01, 86.1814–01, 86.1814–02, 86.1815–01, and 86.1815–02.

(4) Except where otherwise specified, the provisions of this section apply equally to LDVs and all categories of LDTs, and to all MDPVs. Numerous provisions are applicable equally to HLDTs and MDPVs, as reflected by the term HLDT/MDPV. Numerous provisions apply equally to LDVs and LLDTs as reflected by the term LDV/LLDT.

(5) The exhaust emission standards and evaporative emission standards of this section apply equally to certification and in-use LDVs, LDTs and MDPVs, unless otherwise specified.

(b) *Test weight.* (1) Except as required in paragraphs (b)(2) and (b)(4) of this section, or permitted under paragraph (b)(3) of this section, emission testing of all LDVs, LDTs and MDPVs to determine compliance with any exhaust or evaporative emission standard set forth in this Part must be on a loaded vehicle weight (LVW) basis, as that term is defined in this subpart.

(2) Interim non-Tier 2 HLDTs tested to Tier 1 SFTP standards, must be tested on an adjusted loaded vehicle weight (ALVW) basis, as that term is defined in this subpart, during the SC03 element of the SFTP.

(3) Except as required in paragraphs (b)(2) and (b)(4) of this section, interim non-Tier 2 HLDT/MDPVs may be tested on an ALVW basis or an LVW basis to demonstrate compliance with any exhaust or evaporative emission standard set forth in this Part.

(4) MDPVs certified to bin 11 standards from Tables S04–1 and –2 must be tested on an ALVW basis to demonstrate compliance with any exhaust emission standard set forth in this part.

(c) *Tier 2 FTP exhaust emission standards.* Exhaust emissions from Tier 2 vehicles must not exceed the standards in Table S04–1 of this section at full useful life when tested over the Federal Test Procedure (FTP) described in subpart B of this part. Exhaust emissions from Tier 2 vehicles must not exceed the standards in Table S04–2 of this section at intermediate useful life, if applicable, when tested over the FTP.

(1) For a given test group a manufacturer desires to certify to operate only on one fuel, the manufacturer must select a set of standards from the same bin (line or row) in Table S04–1 of this section for non-methane organic gases (NMOG), carbon monoxide (CO), oxides of nitrogen ($NO_X$), formaldehyde (HCHO) and particulate matter (PM).

The manufacturer must certify the test group to meet those standards, subject to all the applicable provisions of this subpart. The manufacturer must also certify the test group to meet the intermediate useful life standards (if any) in Table S04–2 of this section having the same EPA bin reference number as the chosen full useful life standards.

(2) For a given test group of flexible-fueled, bi-fuel or dual fuel vehicles when operated on the alcohol or gaseous fuel they are designed to use, manufacturers must select a bin of standards from Table S04–1 of this section and the corresponding bin in Table S04–2, if any. When these flexible-fueled, bi-fuel or dual fuel vehicles are certified to operate on gasoline or diesel fuel, the manufacturer may choose to comply with the next numerically higher applicable NMOG standard, if any, above the bin which contains the standards selected for certification on the gaseous or alcohol fuel.

(3)(i) For a given test group of flexible-fueled, bi-fuel or dual fuel vehicles certified to bin 10 in Table S04–1, when operated on the alcohol or gaseous fuel they are designed to use, manufacturers may choose to comply with an NMOG standard of 0.230 for LDV/LLDTs or 0.280 g/mi for HLDT/MDPVs at full useful life and corresponding intermediate life standards of 0.160 g/mi and 0.195 g/mi, respectively, when these flexible-fueled, bi-fuel or dual fuel vehicles are certified to operate on gasoline or diesel fuel.

(ii) For a given test group of flexible-fueled, bi-fuel or dual fuel vehicles certified to bin 8 in Table S04–1, when operated on the alcohol or gaseous fuel they are designed to use, manufacturers may choose to comply with a NMOG standard of 0.156 g/mi for LDV/LLDTs and 0.180 for HLDT/MDPVs at full useful life and corresponding intermediate life standards of 0.125 g/mi and 0.140 g/mi, respectively, when these flexible-fueled, bi-fuel or dual fuel vehicles are certified to operate on gasoline or diesel fuel.

(4)(i) For bins where intermediate life standards are applicable, a manufacturer may elect not to comply with such standards. Except as permitted in paragraph (c)(4)(iv) of this section, the manufacturer must certify such vehicles to a useful life of 15 years or 150,000 miles, whichever occurs first, for LDV/LLDTs and HLDT/MDPVs.

(ii) A manufacturer electing not to comply with intermediate life standards, as permitted in paragraph (c)(4)(i) of this section, may not generate additional $NO_X$ credits as described under § 86.1860–04 (g), except as permitted in paragraph (c)(4)(iii) of this section.

(iii) For bins where intermediate life standards are not applicable, or are specified to be optional by paragraph (c)(4)(iv) of this section, a manufacturer may generate additional $NO_X$ credits subject to the provisions in § 86.1860–04 (g).

(iv) For diesel vehicles certified to bin 9 or bin 10, intermediate life standards are optional regardless of whether the manufacturer certifies the test group to a full useful life of 120,000 miles or 150,000 miles.

(5) In a given model year, an individual vehicle may not be included in both the Tier 2 program and an interim program.

(6) Tables S04–1 and S04–2 follow:

TABLE S04–1—TIER 2 AND INTERIM NON-TIER 2 FULL USEFUL LIFE EXHAUST MASS EMISSION STANDARDS

[Grams per mile]

| Bin No. | $NO_X$ | NMOG | CO | HCHO | PM | Notes |
|---|---|---|---|---|---|---|
| 11 | 0.9 | 0.280 | 7.3 | 0.032 | 0.12 | a, c |
| 10 | 0.6 | 0.156/0.230 | 4.2/6.4 | 0.018/0.027 | 0.08 | a, b, d |
| 9 | 0.3 | 0.090/0.180 | 4.2 | 0.018 | 0.06 | a, b, e |
| 8 | 0.20 | 0.125/0.156 | 4.2 | 0.018 | 0.02 | b, f |
| 7 | 0.15 | 0.090 | 4.2 | 0.018 | 0.02 | |
| 6 | 0.10 | 0.090 | 4.2 | 0.018 | 0.01 | |
| 5 | 0.07 | 0.090 | 4.2 | 0.018 | 0.01 | |
| 4 | 0.04 | 0.070 | 2.1 | 0.011 | 0.01 | |
| 3 | 0.03 | 0.055 | 2.1 | 0.011 | 0.01 | |
| 2 | 0.02 | 0.010 | 2.1 | 0.004 | 0.01 | |

TABLE S04–1—TIER 2 AND INTERIM NON-TIER 2 FULL USEFUL LIFE EXHAUST MASS EMISSION STANDARDS—Continued

[Grams per mile]

| Bin No. | $NO_X$ | NMOG | CO | HCHO | PM | Notes |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.000 | 0.0 | 0.000 | 0.00 | |

Notes:
[a] This bin and its corresponding intermediate life bin are deleted at end of 2006 model year (end of 2008 model year for HLDTs and MDPVs).
[b] Higher NMOG, CO and HCHO values apply for HLDTs and MDPVs only.
[c] This bin is only for MDPVs.
[d] Optional NMOG standard of 0.280 g/mi applies for qualifying LDT4s and qualifying MDPVs only.
[e] Optional NMOG standard of 0.130 g/mi applies for qualifying LDT2s only.
[f] Higher NMOG standard deleted at end of 2008 model year.

TABLE S04–2—TIER 2 AND INTERIM NON-TIER 2 INTERMEDIATE USEFUL LIFE (50,000 MILE) EXHAUST MASS EMISSION STANDARDS

[grams per mile]

| Bin No. | $NO_X$ | NMOG | CO | HCHO | PM | Notes |
|---|---|---|---|---|---|---|
| 11 | 0.6 | 0.195 | 5.0 | 0.022 | | a c f h |
| 10 | 0.4 | 0.125/0.160 | 3.4/4.4 | 0.015/0.018 | | a b d f g h |
| 9 | 0.2 | 0.075/0.140 | 3.4 | 0.015 | | a b c f g h |
| 8 | 0.14 | 0.100/0.125 | 3.4 | 0.015 | | b f h i |
| 7 | 0.11 | 0.075 | 3.4 | 0.015 | | f h |
| 6 | 0.08 | 0.075 | 3.4 | 0.015 | | f h |
| 5 | 0.05 | 0.075 | 3.4 | 0.015 | | f h |

**Notes:**
[a] This bin deleted at end of 2006 model year (end of 2008 model year for HLDTs and MDPVs).
[b] Higher NMOG, CO and HCHO values apply for HLDTs and MDPVs only.
[c] This bin is only for MDPVs.
[d] Optional NMOG standard of 0.195 g/mi applies for qualifying LDT4s and qualifying MDPVs only.
[e] Optional NMOG standard of 0.100 g/mi applies for qualifying LDT2s only.
[f] The full useful life PM standards from Table S04–1 also apply at intermediate useful life.
[g] Intermediate life standards of this bin are optional for diesels.
[h] Intermediate life standards are optional for vehicles certified to a useful life of 150,000 miles.
[i] Higher NMOG standard deleted at end of 2008 model year.

(d) *Fleet average $NO_X$ Standards.* (1)(i) For a given individual model year's sales of Tier 2 vehicles, including model years during the phase-in years of the Tier 2 standards, manufacturers must comply with a fleet average oxides of nitrogen ($NO_X$) standard of 0.07 grams per mile. The manufacturer must calculate its fleet average $NO_X$ emission level(s) as described in § 86.1860–04. Up through and including model year 2008, manufacturers must calculate separate fleet average $NO_X$ emission levels for LDV/LLDTs and for HLDT/MDPVs as described in § 86.1860–04.

(ii) During a phase-in year, the manufacturer must comply with the 0.07 g/mi fleet average standard for the required phase-in percentage for that year as specified in paragraph (k)(1) of this section, or for the alternate phase-in percentage as permitted under paragraph (k)(6) of this section.

(2) *For Early Tier 2 LDV/LLDTs.* For model years prior to 2004, where the manufacturer desires to bank early Tier 2 $NO_X$ credits as permitted under § 86.1861(c), the manufacturer must comply with a fleet average standard of 0.07 grams per mile for its Tier 2 LDV/LLDTs. Manufacturers must determine compliance with the $NO_X$ fleet average standard according to regulations in § 86.1860–04 of this subpart.

(3) *For Early Tier 2 HLDT/MDPVs.* For model years prior to 2008, where the manufacturer desires to bank early Tier 2 $NO_X$ credits as permitted under § 86.1861(c), the manufacturer must comply with a fleet average standard of 0.07 grams per mile for its Tier 2 HLDT/MDPVs. Manufacturers must determine compliance with the $NO_X$ fleet average standard according to regulations in § 86.1860–04.

(e) *Evaporative emission standards.* Consistent with the phase-in requirements in paragraph (k) of this section, evaporative emissions from gasoline-fueled, natural gas-fueled, liquefied petroleum gas-fueled, ethanol-fueled and

methanol-fueled vehicles must not exceed the standards in this paragraph (e). The standards apply equally to certification and in-use vehicles.

(1) *Diurnal-plus-hot soak evaporative hydrocarbon standards.* Hydrocarbons for LDV/LLDTs, HLDTs and MDPVs must not exceed the diurnal plus hot soak standards shown in Table S04–3 for the full three diurnal test sequence and for the supplemental two diurnal test sequence. Table S04–3 follows:

TABLE S04–3—LIGHT-DUTY DIURNAL PLUS HOT SOAK EVAPORATIVE EMISSION STANDARDS

[grams per test]

| Vehicle category | 3 day diurnal+hot soak | Supplemental 2 day diurnal+hot soak |
|---|---|---|
| LDV/LLDTs | 0.95 | 1.2 |
| HLDTs | 1.2 | 1.5 |
| MDPVs | 1.4 | 1.75 |

(2) *Running loss standard.* Hydrocarbons for LDVs, LDTs and MDPVs measured on the running loss test must not exceed 0.05 grams per mile.

(3) *Refueling emission standards.* Refueling emissions must not exceed the following standards:

(i) For gasoline-fueled, diesel-fueled and methanol-fueled LDVs, LDTs and MDPVs: 0.20 grams hydrocarbon per gallon (0.053 grams per liter) of fuel dispensed.

(ii) For liquefied petroleum gas-fueled LDV, LDTs and MDPVs: 0.15 grams hydrocarbon per gallon (0.04 grams per liter) of fuel dispensed.

(iii) Refueling standards for HLDTs are subject to the phase-in requirements found in § 86.1810–01(k). MDPVs must also comply with the phase-in requirement in § 86.1810–01(k) and must be grouped with HLDTs to determine phase-in compliance.

(4) *Spitback standards.* For gasoline and methanol fueled LDV/Ts and MDPVs, hydrocarbons measured on the fuel dispensing spitback test must not exceed 1.0 grams hydrocarbon (carbon if methanol-fueled) per test.

(5) *Evaporative emission requirements for interim vehicles.* (i) LDV/Ts not certified to meet the evaporative emission standards in this paragraph (e) as permitted under the phase-in schedule of paragraph (k) of this section, must meet applicable evaporative emission standards in §§ 86.1811–01, 86.1812–01, 86.1813–01, 86.1814–02 or 86.1815–02 except that all LDV/Ts must meet the refueling emission standards in paragraph (e)(3) of this section.

(ii) MDPVs not certified to meet the evaporative emission standards in this paragraph (e) as permitted under the phase-in schedule of paragraph (k) of this section, must meet applicable evaporative emission standards for heavy-duty vehicles in § 86.099–10.

(6) In cases where applicable California emission standards are as stringent or more stringent than applicable standards specified under this paragraph (e), the Administrator may accept data indicating compliance with California standards to demonstrate compliance for certification purposes with the standards required under this paragraph (e). The Administrator may require manufacturers to provide comparative test data to show that a vehicle meeting California standards under California test conditions and procedures will also meet the standards under this paragraph (e) when tested under test conditions and procedures in this Part 86.

(f) *Supplemental exhaust emission standards for LDV/Ts.* (1) Supplemental exhaust emission standards are applicable to gasoline and diesel-fueled LDV/Ts but are not applicable to MDPVs, alternative fueled LDV/Ts, or flexible fueled LDV/Ts when operated on a fuel other than gasoline or diesel. Except as otherwise specified in this paragraph (f), manufacturers must comply with 4000 mile and full useful life SFTP standards as determined in this paragraph (f). The 4000 mile SFTP standards must be taken from Table S04–4 and the full life SFTP standards must be calculated using the formula in paragraph (f)(2) of this section. Table S04–4 follows:

TABLE S04–4—4000 MILE SFTP STANDARDS FOR TIER 2 AND INTERIM NON-TIER 2 LDVS AND LDTS

| | US06 | | SC03 | |
|---|---|---|---|---|
| | NMHC+$NO_X$ (g/mi) | CO (g/mi) | NMHC+$NO_X$ (g/mi) | CO (g/mi) |
| LDV/LDT1 | 0.14 | 8.0 | 0.20 | 2.7 |
| LDT2 | 0.25 | 10.5 | 0.27 | 3.5 |
| LDT3 | 0.4 | 10.5 | 0.31 | 3.5 |
| LDT4 | 0.6 | 11.8 | 0.44 | 4.0 |

(2)(i) Manufacturers must calculate their applicable full useful life SFTP standards for NMHC+ $NO_X$, PM and for CO, if using the weighted CO standard. If not using the weighted CO standard, manufacturers may use the full useful life standalone Tier 1 standards for US06 and SC03. To calculate the applicable full useful life weighted NMHC+ $NO_X$, PM and CO standards, manufacturers must use the following formula:

$$\text{SFTP Standard} = \text{SFTP Standard}_1 - [0.35 \times (\text{FTP Standard}_1 - \text{Current FTP Standard})]$$

Where:

SFTP Standard = Applicable full life weighted SFTP standard for NMHC+ $NO_X$, PM or CO. The NMHC+ $NO_X$ and PM standards must be rounded to two decimal places and the CO standard must be rounded to one decimal place.

$\text{SFTP Standard}_1$ = Applicable full life Tier 1 SFTP standard for NMHC+$NO_X$ or CO from Table S04–5. For PM only, use $\text{FTP Standard}_1$ for $\text{SFTP Standard}_1$.

$\text{FTP Standard}_1$ = Applicable full life Tier 1 FTP standard from Table S04–6 in this paragraph (f). For the Tier 1 NMHC+$NO_X$ standard, add the applicable NMHC and NOx standards.

Current FTP Standard = Applicable full life FTP standard from Table S04–1 in paragraph (c) of this section. For the current NMHC+$NO_X$ standard, add the NMOG and $NO_X$ standards from the applicable bin.

TABLE S04–5—TIER 1 FULL USEFUL LIFE SFTP STANDARDS

| Vehicle category | NMHC + $NO_X$ (weighted g/mi)[a, c] | CO (g/mi)[b, c] | | |
|---|---|---|---|---|
| | | US06 | SC03 | Weighted |
| LDV/LDT1 | 0.91 (0.65) | 11.1 (9.0) | 3.7 (3.0) | 4.2 (3.4) |
| LDT2 | 1.37 (1.02) | 14.6 (11.6) | 4.9 (3.9) | 5.5 (4.4) |
| LDT3 | 1.44 | 16.9 | 5.6 | 6.4 |
| LDT4 | 2.09 | 19.3 | 6.4 | 7.3 |

[a] Weighting for NMHC+$NO_X$ and optional weighting for CO is 0.35x(FTP) +0.28x(US06)+0.37x(SC03).
[b] CO standards are stand alone for US06 and SC03 with option for a weighted standard.
[c] Intermediate life standards are shown in parentheses for diesel LDV/LLDTs opting to calculate intermediate life SFTP standards in lieu of 4,000 mile SFTP standards as permitted under paragraph (f)(6) of this section.

TABLE S04–6—TIER 1 FULL USEFUL LIFE FTP STANDARDS (G/MI)

| Vehicle category | NMHC[a] | $NO_X$[a] | CO[a] | PM |
|---|---|---|---|---|
| LDV/LDT1 | 0.31 (0.25) | 0.6 (0.4) | 4.2 (3.4) | 0.10 |
| LDT2 | 0.40 (0.32) | 0.97(0.7) | 5.5 (4.4) | 0.10 |
| LDT3 | 0.46 | 0.98 | 6.4 | 0.10 |
| LDT4 | 0.56 | 1.53 | 7.3 | 0.12 |

[a] Intermediate life standards are shown in parentheses for diesel LDV/LLDTs opting to calculate intermediate life SFTP standards in lieu of 4,000 mile SFTP standards as permitted under paragraph (f)(6)of this section.

(ii)(A) Manufacturers must determine compliance with NMHC+$NO_X$, CO and PM weighted SFTP standards calculated in paragraph (f)(2)(i) of this section by weighting their emission results as follows:

$0.35\times(FTP)+0.28\times(US06)+0.37\times(SC03)$.

(B) The results of the calculation in paragraph (f)(2)(ii)(A) of this section must be rounded to one more decimal place than the applicable standard calculated in paragraph (f)(2)(i) of this

section and then compared with that standard.

(3) For interim non-Tier 2 gasoline, diesel and flexible-fueled LDT3s and LDT4s, manufacturers may, alternatively, meet the gasoline-fueled vehicle SFTP standards found in §§ 86.1814–02 and 86.1815–02, respectively.

(4) Interim non-Tier 2 gasoline, diesel and flexible-fueled LDV/LLDTs certified to bin 10 FTP exhaust emission standards from Table S04–1 in paragraph (c) of this section may meet the gasoline Tier 1 SFTP requirements found at §§ 86.1811–01(b), 86.1812–01(b), 86.1813–01(b), for LDVs, LDT1s, and LDT2s, respectively.

(5) SFTP standards for PM are not applicable to interim non-Tier 2 LDV/Ts. For Tier 2 LDV/Ts, the 4000 mile PM standard is equal to the full life PM standard calculated under paragraph (f)(2) of this section. The requirements of this paragraph (f)(5) also apply to Tier 2 flexible fuel vehicles when operated on gasoline or diesel fuel. (See regulations in § 86.1829-01(b)(1)(iii)(B) regarding data submittal for PM results for gasoline vehicles.)

(6)(i) In lieu of complying with 4000 mile SFTP standards described in this paragraph, diesel LDV/LLDTs through model year 2006, may comply instead with intermediate life SFTP standards derived from Tier 1 intermediate life SFTP standards for gasoline vehicles.

(ii) To calculate intermediate life SFTP standards, substitute intermediate life Tier 1 FTP and SFTP values from Tables S04–5 and S04–6 in this paragraph (f), as appropriate, for the full life values in the equation in paragraph (f)(2)(i) of this section. Substitute the applicable intermediate life standards for the full life current FTP standard. If there is no applicable intermediate life standard use the full life current FTP standard.

(iii) A manufacturer of diesel LDV/LLDTs must declare which option it will use (4,000 mile or intermediate life standards) in Part I of its certification application.

(7) For diesel vehicles certified to the bin 9 or bin 10 standards of paragraph (c) of this section, 4000 mile SFTP and intermediate life SFTP standards are optional regardless of whether the manufacturer certifies the test group to a full useful life of 120,000 miles or 150,000 miles.

(g) *Cold temperature exhaust emission standards.* These standards are applicable only to gasoline fueled LDV/Ts and MDPVs. For cold temperature exhaust emission standards, a useful life of 50,000 miles applies.

(1) For LDVs and LDT1s, the standard is 10.0 grams per mile CO.

(2) For LDT2s, LDT3s and LDT4s, and MDPVs the standard is 12.5 grams per mile CO.

(3) These standards do not apply to interim non-Tier 2 MDPVs.

(h) *Certification short test exhaust emission standards.* Certification short test emissions from all gasoline-fueled otto cycle LDV/Ts and MDPVs must not exceed the following standards:

(1) Hydrocarbons: 100 ppm as hexane, for certification and SEA testing; 220 ppm as hexane, for in-use testing.

(2) Carbon monoxide: 0.5% for certification and SEA testing; 1.2% for in-use testing.

(3) These standards do not apply to interim non-Tier 2 MDPVs.

(i) Idle CO standards and references to such standards in this subpart, do not apply to any 2004 or later model year LDV, LDT, or MDPV or to any LDV, LDT or MDPV certified to Tier 2 standards before model year 2004 for purposes of generating early $NO_X$ credits or meeting the requirements of an alternative phase-in schedule that begins prior to the 2004 model year.

(j) *Highway $NO_X$ exhaust emission standard.* The maximum projected $NO_X$ emissions measured on the federal Highway Fuel Economy Test in 40 CFR part 600, subpart B, must not be greater than 1.33 times the applicable FTP $NO_X$ standard to which the manufacturer certifies the test group. Both the projected emissions and the product of the $NO_X$ standard and 1.33 must be rounded to the nearest 0.01 g/mi before being compared. This standard is not applicable to MDPVs.

(k) *Phase-in of the Tier 2 FTP exhaust and evaporative requirements; small volume manufacturer flexibilities.* (1) Manufacturers must comply with the phase-in requirements in Tables S04–7 and S04–8 of this paragraph (k) for the Tier 2 FTP exhaust emission requirements

specified in paragraph (c) of this section. Separate phase-in schedules are provided for LDV/LLDTs and for HLDT/MDPVs. These requirements specify the minimum percentage of the manufacturer's LDV/LLDT and HLDT/MDPV U.S. sales, by model year, that must meet the Tier 2 requirements, including the applicable fleet average standard, for their full useful lives. As the terms LDV/LLDT and HLDT/MDVP imply, LDVs and LLDTs must be grouped together to determine compliance with these phase-in requirements and HLDTs and MDPVs must also be grouped together to determine compliance with these phase-in requirements. Tables S04–7 and S04–8 follow:

TABLE S04–7—PHASE-IN PERCENTAGES FOR LDV/LLDT TIER 2 REQUIREMENTS

| Model year | Percentage of LDV/LLDTs that must meet tier 2 requirements |
|---|---|
| 2004 | 25 |
| 2005 | 50 |
| 2006 | 75 |
| 2007 and subsequent | 100 |

TABLE S04–8—PHASE-IN PERCENTAGES FOR HLDT/MDPV TIER 2 REQUIREMENTS

| ModeL year | Percentage of HLDT/MDPVs that must meet tier 2 requirements |
|---|---|
| 2008 | 50 |
| 2009 and subsequent | 100 |

(2) Manufacturers must also comply with the phase-in requirements in Tables S04–7 and S04–8 of this paragraph (k) for the evaporative emission requirements contained in paragraph (e) of this section.

(3) Manufacturers may opt to use different LDV/LLDTs and HLDT/MDPVs to meet the phase-in requirements for evaporative emissions and FTP exhaust emissions, provided that the manufacturer meets the minimum applicable phase-in requirements in Table S04–7 and Table S04–8 of this paragraph (k) for both FTP exhaust and evaporative emissions. A LDV, LDT or MDPV counted toward compliance with any phase-in requirement for FTP exhaust or evaporative standards, must comply with all applicable Tier 2 exhaust requirements or all applicable evaporative requirements, respectively, described in this section.

(4) LDVs, LDTs and MDPVs not certified to meet the Tier 2 FTP exhaust requirements during model years 2004–2008, as allowed under this subpart, are subject to the provisions of paragraph (l) of this section.

(5) *Provisions for small volume manufacturers* (i) Small volume manufacturers, as defined in this part, are exempt from the Tier 2 LDV/LLDT exhaust and evaporative emissions phase-in requirements for model years 2004, 2005 and 2006 in Table S04–7 of this paragraph (k), but must comply with the 100% requirement for the 2007 and later model years for exhaust and evaporative emissions. If not complying with Tier 2 requirements during 2004, 2005 and 2006, small volume manufacturers must comply with the requirements for interim non-Tier 2 LDV/LLDTs.

(ii) Small volume manufacturers, as defined in this part, are exempt from the HLDT/MDPV exhaust and evaporative phase-in requirement for model year 2008 in Table S04–8 of this section but must comply with the 100% requirement for the 2009 model year. Small volume manufacturers are also exempt from the HLDT/MDPV interim fleet average $NO_X$ standard (0.20 g/mi) and its phase-in for the 2004, 2005 and 2006 model years.

(iii) Small volume manufacturers must comply with the FTP exhaust emission standards from Tables S04–1 and 2 of paragraph (c) of this section for all HLDT/MDPVs of model years 2004 and later, except that 2004 model year HLDTs may comply with Tier 1 exhaust emission standards subject to the provisions of paragraph (l)(2)(vii) of this section, and 2004 model year MDPVs may comply with heavy-duty vehicle standards subject to the provisions of paragraph (l)(2)(viii) of this section. Small volume manufacturers must also comply with the 0.20 g/mi fleet average $NO_X$ standard for 2007 and 2008 model year HLDT/MDPVs; the Tier 2 0.07 g/mi fleet average $NO_X$ standard for the 2009 and later model year HLDT/MDPVs; and the evaporative emission standards in Table S04–3 of

this section for the 2009 and later model years.

(6)(i) A manufacturer may elect an alternate phase-in schedule that results in 100% phase-in for LDV/LLDTs by 2007. Alternate phase-in schedules must produce a sum of at least 250% when the percentages of LDV/LLDTs certified to Tier 2 requirements for each model year from 2001 through 2007 are summed. As an example, a 10/25/50/65/100 percent phase-in that began in 2003 would have a sum of 250 percent and would be acceptable. However, a 10/25/40/70/100 percent phase-in that began the same year would have a sum of 245 percent and would not be acceptable.

(ii) A manufacturer electing this option for LDV/LLDTs may calculate its compliance with the evaporative standards in paragraph (e)(1) of this section separately from its compliance with Tier 2 exhaust standards, provided that the phase-in schedules for each separately produce a sum of at least 250 percent when calculated as described in paragraph (k)(6)(i) of this section. A vehicle counted towards compliance with any phase-in requirement for the Tier 2 exhaust standards or the evaporative standards in paragraph (e)(1) of this section, must comply with all applicable Tier 2 exhaust standards or all evaporative standards, as applicable, described in this section.

(iii) In addition to the requirements of paragraphs (k)(6)(i) and (ii) of this section, except as permitted in paragraph (k)(6)(vii) of this section, a manufacturer of LDV/LLDTs electing to use an alternate phase-in schedule for compliance with the Tier 2 exhaust standards or the evaporative standards in paragraph (e)(1) of this section must ensure that the sum of the percentages of vehicles from model years 2001 through 2004, meeting such exhaust or evaporative standards, as applicable, is at least 25%.

(iv) A manufacturer may elect an alternate phase-in schedule that results in 100% phase-in for HLDT/MDPVs by 2009. The requirements of paragraphs (k)(6)(i) through (k)(6)(ii) of this section apply, except that for HLDT/MDPVs, the calculation described in paragraphs (k)(6)(i) and (k)(6)(ii) of this section may cover model years 2001 through 2009 and must produce a sum of at least 150%.

(v) A manufacturer electing to use any alternate phase-in schedule permitted under this section must provide in its Application for Certification for the first year in which it intends to use such a schedule, and in each succeeding year during the phase-in, the intended phase-in percentages for that model year and the remaining phase-in years along with the intended final sum of those percentages as described in this paragraph (k)(6). This information may be included with the information required under §86.1844–01(d)(13). In its year end annual reports, as required under §86.1844–01(e)(4) the manufacturer must include sufficient information so that the Administrator can verify compliance with the alternative phase-in schedule established under paragraph (k)(6) of this section.

(vi) Under an alternate phase-in schedule, the projected phase-in percentage is not binding for a given model year, provided the sums of the actual phase-in percentages that occur meet the appropriate total sums as required in paragraph (k)(6) of this section, and provided that 100% actual compliance is reached for the appropriate model year, either 2007 or 2009, as described in paragraph (k)(6) of this section.

(vii) A manufacturer unable to meet the 25% requirement in paragraph (k)(6)(iii) of this section, must:

(A) Ensure that the sum of the percentages of vehicles for model years 2001 through 2004, meeting such exhaust or evaporative standards, as applicable, is at least 20%.

(B) Subtract that sum of percentages for model years 2001 through 2004 from 25%, and multiply the unrounded result by 2.

(C) Round the product from paragraph (k)(6)(vii)(B) of this section to the nearest 0.1% and add that to 50%. That sum becomes the required phase-in percentage for the 2005 model year.

(D) Comply with the phase-in percentage for the 2005 model year determined in paragraph (k)(6)(vii)(C) of this section.

(E) Comply with a minimum phase-in percentage for the 2006 model year determined by the following equation:

minimum phase-in percentage for 2006 = [75% − ($2005_{api}$ − $2005_{rpi}$)]

Where:

$2005_{rpi}$ = the required phase-in for the 2005 model year as determined in paragraph (k)(6)(vii)(C) of this section; and

$2005_{api}$ = the manufacturer's actual phase-in quantity for the 2005 model year.

(7)(i) Sales percentages for the purpose of determining compliance with the phase-in of the Tier 2 requirements and the phase-in of the evaporative standards in paragraph (e)(1) of this section, must be based upon projected U.S. sales of LDV/LLDTs and HLDT/MDPVs of the applicable model year by the manufacturer to the point of first sale. Such sales percentages must be rounded to the nearest one tenth of a percent, and must not include vehicles and trucks projected to be sold to points of first sale in California or a state that has adopted California requirements for that model year as permitted under section 177 of the Act.

(ii) Alternatively, the manufacturer may petition the Administrator to allow actual volume produced for U.S. sales to be used in lieu of projected U.S. sales for purposes of determining compliance with the phase-in percentage requirements under this section. The manufacturer must submit its petition within 30 days of the end of the model year to the Vehicle Programs and Compliance Division. For EPA to approve the use of actual volume produced for U.S. sales, the manufacturer must establish to the satisfaction of the Administrator, that actual production volume is functionally equivalent to actual sales volume of LDV/LLDTs and HLDT/MDPVs sold in states other than California and states that have adopted California standards.

(iii) Manufacturers must submit information showing compliance with all phase-in requirements of this section with its Part I application as required by § 86.1844(d)(13).

(l) *FTP exhaust standards for interim non-Tier 2 vehicles.*—(1) *FTP exhaust emission standards for interim non-Tier 2 LDV/LLDTs.* (i) LDV/LLDTs that are not used to meet the Tier 2 phase-in requirements including the Tier 2 fleet average $NO_X$ requirement during the Tier 2 phase-in period (model years 2004–2006) must comply with the full useful life FTP exhaust emission standards listed in Table S04–1 of paragraph (c) of this section and the corresponding intermediate useful life standards, if any, in Table S04–2 of paragraph (c) of this section. Manufacturers may choose the bin of full useful life standards to which they certify a test group of vehicles, subject to the requirements in paragraph (l)(3)(i) of this section. In a given model year, an individual vehicle may not be used to comply with both the Tier 2 fleet average $NO_X$ standard and the applicable interim fleet average $NO_X$ standard although vehicles from the same test group may be separated and the vehicles counted toward compliance with either program.

(ii) The provisions of paragraphs (c)(1), (2) and (3) of this section apply to flexible-fueled, dual fuel and multi-fuel interim non-Tier 2 LDV/LLDTs.

(iii) Only manufacturers that comply with the applicable FTP standards in Tables S04–1 and 2 of paragraph (c) of this section for all of their 2004 model year HLDTs and declare their intention to comply with the 2004 model year 25% phase-in requirement to the 0.20 g/mi interim fleet average $NO_X$ standard for HLDTs (or HLDT/MDPVs) described in this paragraph (l) may use the optional higher NMOG values for interim LDT2s certified to bin 9 standards that are shown in Tables S04–1 and 2. Manufacturers must declare their intention to comply with the full 2004 model year 25% phase-in requirement in Part I of their HLDT or their HLDT/MDPV, as applicable, certification applications.

(iv) The provisions of paragraph (c)(4) of this section apply to interim non-Tier 2 vehicles.

(2) *FTP exhaust emission standards for interim non-Tier 2 HLDTs and interim non-Tier 2 MDPVs.* (i) Except as permitted under paragraphs (l)(2) (vii) and (viii) of this section, HLDTs and MDPVs of model years 2004–2008 that are not used to meet the Tier 2 FTP phase-in requirements including the Tier 2 fleet average $NO_X$ requirement must comply with the full useful life FTP exhaust emission standards listed in Table S04–1 of paragraph (c) of this section and, the corresponding intermediate useful life standards, if any, in

Table S04–2 of paragraph (c) of this section. Manufacturers may choose the bin of full useful life standards to which they certify a test group of vehicles, subject to the requirements in paragraph (l)(3)(ii) of this section.

(ii) Except as permitted under paragraphs (l)(2) (vii) and (viii) of this section, HLDTs and MDPVs of model years 2004–2008 that are not used to meet the Tier 2 FTP phase-in requirements including the Tier 2 fleet average $NO_X$ requirement must comply with the fleet average $NO_X$ standard described in paragraph (l)(3)(ii) of this section subject to the phase-in schedule in paragraph (l)(2)(iv) of this section, i.e. 25 percent of the HLDT and MDPVs must meet the fleet average standard of 0.20 g/mi in 2004, 50 percent in 2005, and so on.

(iii) Manufacturers may choose the bin of full useful life standards and corresponding intermediate life standards to which they certify test groups of HLDTs and MDPVs, subject to the requirements in paragraph (l)(3)(ii) of this section. Manufacturers may include HLDT/MDPVs in the interim program that are not used to meet the Tier 2 fleet average $NO_X$ standard or the phase-in percentage requirements in the Tier 2 program or to generate Tier 2 $NO_X$ credits. In a given model year, an individual vehicle may not be used to comply with both the Tier 2 fleet average $NO_X$ standard and the applicable interim fleet average $NO_X$ standard although vehicles from the same test group may be separated and the vehicles counted toward compliance with either program.

(iv) *Phase-in schedule for interim non-Tier 2 HLDT/MDPVs.* Table S04–9 of this paragraph (l) specifies the minimum percentage of the manufacturer's interim non-Tier 2 HLDT/MDPV U.S. sales, by model year, that must comply with the fleet average $NO_X$ standard described in paragraph (l)(3)(ii) of this section. Table S04–9 follows:

TABLE S04–9—PHASE-IN PERCENTAGES FOR COMPLIANCE WITH INTERIM NON-TIER 2 FLEET AVERAGE $NO_X$ STANDARD FOR HLDT/MDPVS

| Model year | Percentage of non-tier 2 HLDT/MDPVs that must meet interim non-tier 2 fleet average $NO_X$ standard |
|---|---|
| 2004 | 25 |
| 2005 | 50 |
| 2006 | 75 |
| 2007 and 2008 | 100 |

(v)(A) A manufacturer may elect an alternate phase-in schedule, beginning as early as the 2001 model year, that results in 100% compliance by 2007 with the fleet average $NO_X$ standard for interim non-Tier 2 HLDT/MDPVs described in paragraph (l)(3)(ii) of this section. The requirements of paragraph (k)(6) of this section apply to the selection of an alternate phase-in schedule.

(B) If a manufacturer elects not to bring all of its HLDT/MDPVs into compliance with the interim requirements in 2004 as permitted under paragraphs (l)(2)(vii) and

(viii) of this section, it may still use an alternate phase-in schedule to attain 100% compliance with the interim fleet average $NO_X$ standard for HLDT/MDPVs, but the sum of phase-in percentages it must meet will be 225% rather than 250%. If the manufacturer commences its 2004 model year on or after December 21, 2003, for any HLDT/MDPVs, the manufacturer must increase the 225% by the fraction of its 2004 model year HLDT/MDPVs whose model year commenced on or after that date and which were brought into compliance with the 0.20 g/mi corporate average $NO_X$ standard as required under paragraph (l)(2)(ix) of this section. The manufacturer must ensure that the sum of the percentages of vehicles up through model year 2005 complying with the interim fleet average $NO_X$ standard is at least 50%.

(vi) The provisions of paragraphs (c)(1), (2) and (3) of this section apply to flexible-fueled, dual fuel and multi-fuel interim non-Tier 2 HLDT/MDPVs.

(vii) For 2004 model year HLDT test groups whose model year commences before December 21, 2003, the manufacturer may exempt such HLDTs from

compliance with any requirements applicable to interim non-Tier 2 HLDTs, and such HLDTs must be produced in accordance with standards and requirements in §§ 86.1814–02 and §§ 86.1815–02. Such HLDTs must also meet the refueling emission standards contained in paragraph (e)(3) of this section.

(viii) For 2004 model year heavy-duty vehicles whose model year commences before December 21, 2003, the manufacturer may exempt such vehicles from compliance with any requirements applicable to interim non-Tier 2 MDPVs. Exempted vehicles will not be considered MDPVs and must be produced in accordance with standards and requirements in § 86.099–10. Exempted vehicles are also exempted from refueling emission standards.

(ix) For 2004 model year HLDT and MDPV test groups whose model year commences on or after December 21, 2003, the manufacturer must comply with all interim non-Tier 2 requirements in this section.

(A) All such vehicles, but not more than 25% of the manufacturer's total sales of 2004 model year HLDT/MDPVs must meet the interim non-Tier 2 fleet average $NO_X$ standard as described in paragraph (l)(3)(ii) of this section.

(B) All such vehicles but not more than 40% of the manufacturer's 2004 model year HLDT/MDPVs must comply with the refueling requirements in paragraph (e)(3) of this section.

(x) Only those manufacturers that comply with the interim non-Tier 2 FTP standards for all of their 2004 model year HLDTs and declare their intention to comply with the 2004 model year 25% phase-in requirement to the fleet average interim $NO_X$ standard for HLDTs or HLDT/MDPVs of 0.20 g/mi described in paragraph (l) of this section may use the optional higher NMOG values for interim LDT4s certified to bin 10 standards that are shown in Tables S04–1 and 2 of paragraph (c) of this section. Manufacturers must declare their intention to comply with the 2004 model year 25% phase-in requirement in Part I of their HLDT certification applications.

(xi) Only those manufacturers that comply with the interim non-Tier 2 FTP standards for all of their 2004 model year MDPVs, and declare their intention to comply with the 2004 model year 25% phase-in requirement to the fleet average interim $NO_X$ standard for MDPVs or HLDT/MDPVs of 0.20 g/mi described in paragraph (l) of this section may:

(A) Use the exhaust emission standards of bin 11 in Tables S04–1 and S04–2 of paragraph (c) in this section for MDPVs through model year 2008;

(B) For diesel-fueled vehicles, certify the engines in such vehicles, through model year 2007, to provisions in this part 86 applicable to diesel-fueled heavy-duty engines of the appropriate model year. Such diesel fueled vehicles must not be included in any count or determination of compliance with the phase-in requirements applicable to interim non-Tier 2 MDPVs; and

(C) Use the optional higher NMOG values for interim LDT4s certified to bin 10 standards that are shown in Tables S04–1 and 2.

(xii) Manufacturers electing to comply with the provisions of paragraph (l)(2)(xi) of this section must declare their intention to comply with the 2004 model year 25% phase-in requirement to the fleet average interim $NO_X$ standard for MDPVs or HLDT/MDPVs of 0.20 g/mi in Part I of their MDPV certification applications.

(xiii) Where diesel-fueled heavy-duty engines are used as permitted under paragraph (l)(2)(xi)(B) of this section, such engines must be treated as a separate averaging set—MDPV HDDEs—under the averaging, banking and trading provisions applicable to heavy-duty diesel engines. Only $NO_X$ credits generated by engine-certified diesel engines that are used in other MDPVs can be applied to these engines. Manufacturers wishing to average, bank or trade credits for MDPV HDDEs must comply with the requirements in this paragraph and with all requirements applicable to heavy-duty engine averaging, banking and trading in this part.

(3) *Fleet average $NO_X$ standards for interim non-Tier 2 LDV/Ts and MDPVs.* (i) Manufacturers must comply with a fleet average full useful life $NO_X$ standard for their interim non-Tier 2 LDV/LLDTs, on an annual basis, of 0.30 grams per mile.

(ii) Manufacturers must comply with a fleet average full useful life $NO_X$ standard for their interim non-Tier 2 HLDT/MDPVs, excluding those HLDTs and MDPVs not yet covered by the phase-in requirement described in paragraph (l)(2)(ii) of this section, on an annual basis, of 0.20 grams per mile.

(iii) Manufacturers must determine their compliance with these interim fleet average $NO_X$ standards for each model year by separately computing the sales weighted average $NO_X$ level of all interim non-Tier 2 LDV/LLDTs and all interim non-Tier 2 HLDT/MDPVs (excluding those not yet phased in as described in paragraph (l)(2)(ii) of this section), using the methodology in § 86.1860.

(iv) Manufacturers may generate, bank, average, trade and use interim non-Tier 2 $NO_X$ credits based on their $NO_X$ fleet average as determined under paragraph (l)(3)(iii) of this section. Unless waived or modified by the Administrator, the provisions of § 86.1861 of this part apply to the generation, banking, averaging, trading and use of credits generated by interim non-Tier 2 vehicles. $NO_X$ credits generated by interim non-Tier 2 vehicles are not subject to any discount except as required by § 86.1861–04(e).

(m) *NMOG standards for diesel, flexible fueled and dual-fueled LDV/Ts and MDPVs.* (1) For diesel fueled LDV/Ts and MDPVs, the term "NMOG" in both the Tier 2 and interim non-Tier 2 standards means non-methane hydrocarbons.

(2) Flexible-fueled and dual-fuel Tier 2 and interim non-Tier 2 vehicles must be certified to NMOG exhaust emission standards both for operation on gasoline and on any alternate fuel they are designed to use. Manufacturers may measure NMHC in lieu of NMOG when flexible-fueled and dual-fuel vehicles are operated on gasoline, subject to the requirements of § 86.1810(p).

(n) *Hybrid electric vehicle (HEV) and Zero Emission Vehicle (ZEV) requirements.* For FTP and SFTP exhaust emissions, and unless otherwise approved by the Administrator, manufacturers must measure emissions from all HEVs and ZEVs according to the requirements and test procedures found in the document entitled California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-duty Truck and Medium-duty Vehicle Classes. This document is incorporated by reference (see § 86.1) . Requirements and procedures in this document that are relevant only to complying with the California ZEV mandate, computing partial and full ZEV allowance credits, or generating and using ZEV credits, are not relevant to the federal program and may be disregarded. Discussion in that document relevant to fleet average NMOG standards and NMOG credits may also be disregarded.

(o) *NMOG measurement.* (1) Manufacturers must measure NMOG emissions in accordance with Part G of the California Non-Methane Organic Gas Test Procedures. These requirements are incorporated by reference (see § 86.1).

(2) Manufacturers must not apply reactivity adjustment factors (RAFs) to NMOG measurements. See § 86.1841.

(p) *In-use standards.* (1) Table S04–10 of this paragraph (p) contains in-use emission standards applicable only to vehicles certified to the bins shown in the table. These standards apply to in-use testing performed by the manufacturer pursuant to regulations at §§ 86.1845–01, 86.1845–04 and 86.1846–01 and to in-use testing performed by EPA. These standards do not apply to certification or Selective Enforcement Auditing.

(2) These standards apply only to LDV/LLDTs produced up through the 2008 model year, and HLDT/MDPVs produced up through the 2010 model year. These standards are subject to other limitations described in paragraph (p)(3) of this section.

(3) For the first model year and also for the next model year after that, in which a test group of vehicles is certified to a bin of standards to which it has not previously been certified, the standards in Table S04–10 of this paragraph (p) apply for purposes of in-use testing only. The standards apply equally to all LDV/Ts and MDPVs subject to the model year limitation in paragraph (p)(2) of this section. Table S04–10 follows:

TABLE S04–10—IN-USE COMPLIANCE STANDARDS (G/MI)
[Certification standards shown for reference purposes]

| Bin number | Durability period (miles) | $NO_X$ In-use | $NO_X$ certification | NMOG In-use | NMOG certification |
|---|---|---|---|---|---|
| 5 | 50,000 | 0.07 | 0.05 | n/a | 0.075 |
| 5 | 120,000 | 0.10 | 0.07 | n/a | 0.090 |
| 4 | 120,000 | 0.06 | 0.04 | n/a | 0.070 |
| 3 | 120,000 | 0.05 | 0.03 | 0.09 | 0.055 |
| 2 | 120,000 | 0.03 | 0.02 | 0.02 | 0.010 |

(4) For diesel vehicles certified to bin 10, separate in-use standards apply for $NO_X$ and PM emissions. These standards are determined by multiplying the applicable $NO_X$ and PM certification standards by factors of 1.2 and 1.35, respectively, and then rounding the result to one more decimal place than contained in the certification standard. The resultant standards do not apply for certification or selective enforcement auditing.

(q) *Hardship provision for small volume manufacturers.* (1) A small volume manufacturer may apply for relief from any applicable final phase-in model year contained in this section. Relief will only be available to defer required compliance with a completely new set of standards, a fleet average $NO_X$ standard, and/or evaporative emission standard for 100% of affected vehicles for one model year. Thus, a small volume manufacturer that obtains relief may:

(i) Defer 100% compliance with the fleet average $NO_X$ standard for interim LDV/LLDTs (0.30 g/mi) until 2005;

(ii) Defer 100% compliance with the evaporative emission standards and/or fleet average $NO_X$ standard for Tier 2 LDV/LLDTs (0.07 g/mi) until 2008;

(iii) Defer 100% compliance with the requirements that interim HLDTs and MDPVs comply with applicable emission standards shown in Tables S04–1 and S04–2, until 2005;

(iv) Defer 100% compliance with the fleet average $NO_X$ standard for interim HLDT/MDPVs (0.20 g/mi) until 2008; and

(v) Defer 100% compliance with the the evaporative emission standards and/or fleet average $NO_X$ standard for Tier 2 HLDT/MDPVs (0.07 g/mi) until 2010.

(2) Applications for relief must be in writing and must:

(i) Be submitted before the earliest date of noncompliance;

(ii) Include evidence that the manufacturer will incur severe economic hardship if relief is not granted;

(iii) Include evidence that the noncompliance will occur despite the best efforts of the manufacturer to comply; and

(iv) Include evidence that the manufacturer has made every reasonable effort to purchase credits to address the noncompliance, where applicable.

(r) *NMOG standard adjustment for direct ozone reducing devices.* (1) A manufacturer may obtain NMOG credit for use in certifying to the exhaust NMOG standards listed in paragraph (c) of this section and for use in complying with the in-use standards of paragraph (p) of this section, where applicable. This credit effectively allows the manufacturer to increase the exhaust NMOG emission standards listed in these paragraphs by the amount of the applicable credit. For example, if the applicable NMOG credit was 0.01 g/mi, and the vehicle was being certified in Bin 5, as described in Table S04–1 of paragraph (c) of this section, exhaust NMOG emissions must be no greater than 0.10 g/mi, as opposed to the normal NMOG certification standard of 0.09 g/mi in Bin 5.

(2) The NMOG credit must be determined through a two-step process.

(i) The first step must determine the ozone reduction potential of the direct ozone reducing device, the ozone reduction potential of exhaust NMOG reductions beyond Bin 5 of the Tier 2 standards, and the ratio of the two methods of reducing ambient ozone levels. The requirements for this step are described in paragraph (r)(3) of this section.

(ii) The second step must demonstrate and certify the relevant performance characteristics of the specific

ozone reducing device. The requirements for this step are described in paragraph (r)(4) of this section.

(3) The ozone reduction potential of the direct ozone reducing device and the ozone reduction potential of exhaust NMOG reductions beyond Bin 5 of the Tier 2 standards must be estimated using procedures which are approved by the Administrator in advance. At a minimum:

(i) The modeling must utilize an urban airshed model using up-to-date chemical and meteorological simulation techniques;

(ii) Four local areas must be modeled: New York City, Chicago, Atlanta and Houston;

(iii) The ozone episodes to be modeled must meet the selection criteria established by EPA for State ozone SIPs;

(iv) Photochemical and dispersion modeling must follow that used by EPA to project the ozone impacts of this rule, or its equivalent;

(v) Emission projections must be made for calendar year 2007 and be consistent with those used by EPA in support of this final rule, or reflect updates approved by EPA;

(vi) Baseline emissions (emissions prior to use of the direct ozone reducing device or the VOC emission reductions) must include the benefits of the Tier 2 emission and sulfur standards; as well as all other emission controls assumed in EPA's ozone modeling of the benefits of the Tier 2 and sulfur standards, as described in the Final Regulatory Impact Analysis to the Tier 2 and Sulfur Rule;

(vii) The ozone benefit of the direct ozone reducing device must assume a radiator area of 0.29 square meters, an air flow velocity through the radiator of 40% of vehicle speed, and an ozone reduction efficiency of 80%, or other values as approved by the Administrator;

(viii) The ozone level of the air entering the direct ozone reducing device must be assumed to be 40% less than that existing in the grid cell where the vehicle is located;

(ix) The ozone benefit of VOC emission reductions must be modeled by assuming that all Tier 2 LDVs, LDTs and MDPVs meet an exhaust NMOG standard of 0.055 g/mi or lower instead of a 0.09 g/mi NMOG standard;

(x) The ozone reducing device must be assumed to be present on all of the Tier 2 LDVs, LDTs and MDPVs modeled as meeting the more stringent NMOG standard described in paragraph (r)(3)(ix) of this section;

(xi) The relationship between changes in exhaust NMOG emission standards and in-use VOC emissions must be determined sufficiently far in the future to ensure that the change in ozone being modeled is sufficiently large to allow comparison with the impact of the ozone reducing device;

(xii) LDV, LDT and MDPV emissions must be modeled using the updated Tier 2 emission model developed by EPA as part of the Tier 2 rulemaking (available from EPA upon request) or MOBILE6, once this model is available;

(xiii) The ozone benefit of the direct ozone reducing device must be the reduction in the peak one-hour ozone level anywhere in the modeled region on the day when ozone is at its highest;

(xiv) The NMOG credit in each local area must be the reduction in peak one hour ozone associated with use of the direct ozone reducing device divided by the reduction in peak one hour ozone associated with the more stringent exhaust NMOG emission standard multiplied by the reduction the exhaust NMOG standard (in g/mi) modeled in paragraph (r)(3)(ix) of this section; and

(xv) The NMOG credit applicable to the generic direct ozone reducing device modeled in paragraph (r)(3)(vii) of this section must be determined by arithmetically averaging the NMOG credit determined in paragraph (r)(3)(xiv) of this section for each of the four local areas.

(4) The manufacturer must submit data, using procedures which have been approved by the Administrator in advance, that demonstrate the following aspects of the device being certified:

(i) The air flowrate through the device as a function of vehicle speed;

(ii) The ozone reduction efficiency of the device over the useful life of the vehicle for a range of vehicle speeds and ozone levels;

(iii) The method through which the onboard diagnostic system will detect improper performance.

(5) The NMOG credit for the specific application of this technology tested under the provisions of paragraph (r)(4) of this section is the four-area NMOG credit determined in paragraph (r)(3)(xv) of this section scaled based on the performance of the specific application tested under the provisions of paragraph (r)(4) of this section relative to those assumed in paragraph (r)(3)(vii) of this section. This scaling must assume a linear relationship between the NMOG credit and three aspects of the direct ozone reducing device: radiator area, average air flow through the radiator relative to vehicle speed, and ozone reduction efficiency and the NMOG credit. The NMOG credit must be rounded to the nearest 0.001 g/mi. For example, if the NMOG credit determined in paragraph (r)(3)(xv) of this section was 0.01 g/mi and the specific direct ozone reducing device being certified had an area of 0.20 square meters, an air flow velocity of 30% of vehicle speed and an ozone reducing efficiency of 70%, and the generic ozone reducing device simulated in the ozone model under paragraph (r)(3)(vii) of this section had an area of 0.29 square meters, an air flow velocity of 40% of vehicle speed and an ozone reducing efficiency of 80%, the NMOG credit applicable to the specific device being certified would be:

0.01 g/mi * (0.20/0.29) * (30%/40%) * 70%/80%) = 0.005

(s) Manufacturers may request to group heavy-duty vehicles into the same test group as other vehicles subject to more stringent standards, so long as all vehicles in the test group meet the most stringent standards applicable to any vehicle within that test group, as provided at § 86.1827–1(a)(5) and (d)(4).

[65 FR 6854, Feb. 10, 2000; 65 FR 10598, Feb. 28, 2000, as amended at 65 FR 59970, Oct. 6, 2000; 66 FR 19309, Apr. 13, 2001; 67 FR 72825, Dec. 6, 2002]

### § 86.1812–01 Emission standards for light-duty trucks 1.

This section applies to 2001 and later model year light-duty truck 1's fueled by gasoline, diesel, methanol, natural gas and liquefied petroleum gas fuels except as noted. Multi-fueled vehicles shall comply with all requirements established for each consumed fuel. For methanol fueled vehicles, references in this section to total hydrocarbons shall mean total hydrocarbon equivalents and references to non-methane hydrocarbons shall mean non-methane hydrocarbon equivalents. This section does not apply to 2004 and later model year vehicles, except as specifically referenced by § 86.1811–04.

(a) *Exhaust emission standards.* (1) Exhaust emissions shall not exceed the following standards at intermediate useful life:

(i) [Reserved]

(ii) Non-methane hydrocarbons: 0.25 grams per mile.

(iii) Carbon monoxide: 3.4 grams per mile.

(iv) Oxides of nitrogen: 0.4 grams per mile except diesel fuel which have a 1.0 gram per mile standard.

(v) Particulate matter: 0.08 grams per mile.

(2) Exhaust emissions from 2001 and later model year light-duty truck 1's shall not exceed the following standards at full useful life:

(i) Total hydrocarbons: 0.80 grams per mile, except natural gas, which has no standard. For purposes of this section, the full useful life total hydrocarbon standard is for 11 years or 120,000 miles whichever occurs first.

(ii) Non-methane hydrocarbons: 0.31 grams per mile.

(iii) Carbon monoxide: 4.2 grams per mile.

(iv) Oxides of nitrogen: 0.6 grams per mile except diesel fuel which have a 1.25 gram per mile standard.

(v) Particulate matter: 0.10 grams per mile.

(b) *Supplemental exhaust emission standards.* (1) Supplemental exhaust emissions from gasoline-fueled and diesel-fueled light-duty truck 1's shall not exceed the following standards at intermediate useful life:

(i) Nonmethane hydrocarbon and oxides of nitrogen composite: 0.65 grams per mile except diesel fuel which have a 1.48 gram per mile standard.

(ii) *Carbon monoxide.* Regulated vehicles shall meet at least one of the following two sets of standards:

(A) *Individual US06 and SC03 Air Conditioning compliance.* Comply with both the following standards: